NOTES ON THE ASIATIC FLORA

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A NEW SPECIES OF SCROPHULARIA FROM UPPER BURMA

IN A STUDY of the genus *Scrophularia* of China, it is noted that in the alpine regions of western China and adjacent areas there occur many endemic species of very limited range. Continuous to western Yunnan in Upper Burma there appears an apparently new species which is herein described. The material is based on the collections of the herbarium of the New York Botanical Garden.

Scrophularia birmanica sp. nov.

Planta nana, 15–18 cm. alta, caulibus simplicibus glabris, erectis, basi squamosis, rhizomate lignoso longo crasso 6–7 cm. longo; foliis oppositis breviter petiolatis, petiolis ad 2–3 mm. longis, subalatis margine ciliatis, lamina ovata, ad 2.5 cm. longa et 1.8 cm. lata, apice acuta, basi rotundata vel subcordata, margine irregulariter acute crenato-serrata, foliis in sicco chartaceis utrinque glabris, reticulo nervorum subtus conspicuo; inflorescentiis in verticillastris 1–2 densis multifloris aggregatis, pedicellis erectis 3–5 mm. longis glabris; bracteis lanceolatis 4–5 mm. longis, calycibus 6–7 mm. longis glabris ad 2/3 lobatis, subobliquis, lobis oblongis obtusis vel rotundatis, extus parce puberulis; corolla flava 1.5 cm. longa, 4–5 mm. lata, intus villosa, extus glabra, tubo fere cylindrico, 8–10 mm. longo; lobo summo 5–7 mm. longo, alte bilobo, lobis rotundatis, lobis lateralibus et lobo antico 2–3 mm. longis rotundatis, erectis; staminibus inclusis, filamentis parce pubescentibus; staminodio reniformi; stylo glabro, 5 mm. longo; ovario glabro; capsula ignota.

Type, on stony alpine meadows, at altitudes of 3660–4020 meters, on western flank of N'Maika-Salwin divide, Upper Burma, collected in flower, June, 1925, by *G. Forrest*, no. *26859*; holotype in the herbarium of the New York Botanical Garden.

UPPER BURMA: Western flank of N'Maika-Salwin divide, *G. Forrest 26859, 27308*, in the herbarium of the New York Botanical Garden.

This species is related to *S. Delavayi* Franch. of northwestern Yunnan, differing in being of smaller size, with smaller and shorter petiolate leaves, rounded calyx-lobes, and narrower corolla.

THE GENUS DIPHYLLEIA

The genus *Diphylleia* of the Berberidaceae is of particular interest because of its phylogenetic and distributional significance. Like other perennial herbaceous genera of the family, such as *Podophyllum*, *Jeffersonia*, *Caulophyllum*, and *Achlys*, it deviates from ordinary dicotyledons in having irregularly arranged vascular bundles in the stem. These

genera are somewhat similar in habit and habitat. They are small genera with only a few species, and these occur in discontinuous areas in eastern Asia and North America, each occupying a more or less limited range. These plants are geophilous herbs with well-developed rootstocks and a few large palmately-lobed leaves. Most of them grow on mountain slopes at fairly high altitudes as undergrowth in deciduous forests, usually in association with certain genera of the Ranunculaceae like *Cimicifuga*, *Trautvetteria*, etc.

The range of *Diphylleia*, like that of *Podophyllum*, *Jeffersonia*, and *Caulophyllum*, is discontinuous in two widely separated regions, namely, eastern Asia and eastern North America. In eastern North America the genus is found only in a very limited area in the Blue Ridge from Georgia to Virginia at altitudes from about 1000 to 1650 meters. In eastern Asia there are two separate areas. One is in the alpine regions from central Japan northward to Sakhalin and in the Amur region on the continent. The other is in central and western China, attaining an altitude of 3700 meters. The taxonomy of the genus as it occurs in these three separate areas is in need of clarification.

The American species is *D. cymosa* Michx. The plant that is found in insular and maritime northeastern Asia from central Japan to Sakhalin and the Amur region is known as *D. Grayi* F. Schmidt. Diels (Bot. Jahrb. 29: 336–337. 1900) recorded the genus as occurring in central China in Hupeh province and named the plant *D. cymosa* Michx. He considered the genus to be monotypic, and consequently the Japanese *D. Grayi* was reduced to varietal standing. Kumazuwa (Jour. Fac. Sci. Univ. Tokyo III. Bot. 2: 346–380, *f. 1–20*. 1930), in outlining the range of the genus, considered *D. Grayi* as limited to Japan, and *D. cymosa* as being found in eastern Siberia and central China, as well as in North America. It is uncertain whether his conclusion was authenticated by actual specimens or whether it was based on earlier records like that of Diels.

On studying all available specimens of the genus from America, China, and Japan, I am convinced that at least three species are recognizable, one in eastern North America and two in eastern Asia. The insular Asiatic plant found in Japan and Sakhalin is distinct from the plant found in China in Hupeh, Szechuan, and Yunnan, and this fact is substantiated by many specimens from both regions. Numerous specimens from eastern North America have also been observed, and they prove to be of a single species. No specimen has been seen from eastern Siberia. Thus it is impossible to say whether the plant from the Amur region is the same as the insular species or the central-western Chinese species. From the point of geographical proximity it is more likely to be identical with the former than with the latter. There is also the possibility that it is a distinct species or variety. The Chinese species, hitherto unnamed, is described as follows:

Diphylleia sinensis sp. nov.

Planta perennis, rhizoma crassum, radicibus parvis teretibus, fibrosis;

caulibus singulis, carnosis, 60–90 cm. altis, leviter puberulis; foliis singulis vel pluribus, longe petiolatis; petiolis ad 45 cm. longis, leviter puberulis; lamina palmata, rotundata, apice ad medium lobata, ad 15–20 cm. longa, 20–30 cm. lata, margine distanter et valde inconspicue dentata, dentibus acutis, 10–25; inflorescentiis terminalibus, singulis vel raro paribus, elongatis, cymosis, ramis iterum dichotomis vel raro simplicibus; pedicellis 5–25 mm. longis; petalis 5, ovatis vel obovatis, circiter 6 mm. longis et 4 mm. latis, subrotundatis; staminibus inclusis, filamentis crassis, 2 mm. longis, antheris elongatis, 2 mm. longis; ovariis ovoideis, 2 mm. longis; fructu subsphaerico, circiter 8–9 mm. diametro, glabro.

CHINA. Szechuan: western Szechuan, *E. H. Wilson 814* (TYPE), July and August, 1908. Hupeh: *A. Henry 6820*. Yunnan: Mount Fu-chuan, southwest of Wei-hsi, Mekong-Salween divide, *J. F. Rock 16971*, May-June 1928, in shade of fir forest, alt. 3700 m.

Wilson 814 bears both flowers and fruits. The other two collections are fruiting materials only. The specimens are all in the Gray Herbarium.

The American species, *D. cymosa* Michx., differs from both Asiatic species in that the leaves are more deeply lobed, with the lobes pointed, and the inflorescence is glabrous. The two Asiatic species have more shallowly lobed leaves and puberulous inflorescences. The leaves of the insular species, *D. Grayi* Schmidt, are intermediate between the American *D. cymosa* and the Chinese *D. sinensis*. They are less deeply lobed than in the former but more so than in the latter. The Japanese plant further differs from the Chinese plant in its more glabrous leaves, its sessile or subsessile terminal leaf, its more branched inflorescence, its larger petals and larger fruits. In *D. Grayi*, the Japanese species, the inflorescence rises at the exact base of the blade of the subtending leaf. In the Chinese plant the inflorescence rises on the leaf stalk at a point about 5 to 8 cm. below the leaf-blade. In this respect the American and Chinese species are similar, while the geographically intervening Japanese species stands out as different from both.

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